

Note to Reader – This is a DRAFT to promote public discussion. Comments are not only welcome, they are encouraged. You may participate through a public meeting that will be scheduled in December as well as send comments to John Sowles by phone at 633-9518, or in writing at Dept. of Marine Resources, P.O. Box 8, West Boothbay Harbor, ME 04575-0008, or by e-mail at [john.sowles@maine.gov](mailto:john.sowles@maine.gov)

## **DRAFT**

# **Report to the Joint Standing Committee on Marine Resources of the 123<sup>rd</sup> Maine Legislature on a Proposed Comprehensive Resource Management Plan for Taunton Bay, Maine**

## **Background and Historical Context**

This proposed comprehensive resource management plan for Taunton Bay evolved over the course of seven years, the chronology of which is somewhat complicated. Beginning in 2000, Taunton Bay was closed to bottom dragging. The moratorium, lasting five years, was prompted by the pending replacement of the Route 1A “Singing Bridge” with a higher structure that would allow access to Taunton Bay by a larger size class of commercial mussel draggers. While scallops, urchins and mussels in Taunton Bay had been dragged for decades, the vessels and gear that could access the bay were relatively small in comparison to the more contemporary mussel dragging fleet. By 2000, both the urchin and scallop fishery had been all but depleted (ultimately by a diver fishery) with only mussels remaining in commercially viable quantities. With the potential for more and larger draggers entering the bay, questions were raised about the sustainability of the remaining mussel fishery and the potential effects of larger scale dragging on Taunton Bay’s habitats, water quality, wildlife and harvestable resources.

Included in the initial legislation was a directive to the Department of Marine Resources (DMR) to assess the impacts of mussel dragging in Taunton Bay and report back to the Legislature with findings and recommendations. Ostensibly, those findings and recommendations would aid the Legislature in deciding the future of dragging in the bay. In 2005, the DMR submitted its report to the Legislature. In it were three recommendations:

- 1) Continue the prohibition on use of drags in Taunton Bay, with the possible exception of intensely managed dragging conducted in accordance with a comprehensive plan.
- 2) Establish a stakeholder-staffed working group charged with developing an area-focused, science-based comprehensive resource management plan.
- 3) Promote efforts to characterize the short and long-term ecological consequences of dragging and other methods of harvest that result in consistently significant seabed disturbance.

In 2004, one year prior to the moratorium's sunset, an unrelated yet ultimately relevant piece of legislation was passed requiring the Land and Water Resources Committee<sup>1</sup> (LWRC), through the DMR and State Planning Office (SPO), to conduct a statewide "Bay Management Study." The Bay Management Study was to evaluate the potential for more regional management of coastal waters. As part of the statewide study, the Friends of Taunton Bay were awarded a small grant to conduct the *Taunton Bay Study - a Pilot Project in Collaborative Bay Management*.

In 2005, the Legislature's Marine Resources Committee (MRC) considered extending the dragging moratorium and considering the recommendations of the DMR dragging impacts study. By then, however, larger LWRC Bay Management Study had completed several public meetings along the coast and the pilot Taunton Bay Study was well underway. Since the final report for the *Taunton Bay Study* grant would be due in 2006, one year after expiration of the dragging moratorium, the Marine Resources Committee extended the moratorium to allow sufficient time for the various projects to complete their work and avoid predetermining the outcome of that work. From testimony and discussion on the dragging moratorium bill, it was clear that the MRC had little interest in closing Taunton Bay indefinitely to mussel dragging, without a solid basis. As a result, the moratorium extension included a directive to the DMR to prepare a comprehensive resource management plan for Taunton Bay, due January 12, 2007 (see box), nearly coinciding with the January 15<sup>th</sup> delivery date of the Bay Management Study. This timetable would allow the Legislature time to consider and adopt resource management legislation before the dragging ban expired.

**Sec. 2. Report.** No later than January 12, 2007, the Department of Marine Resources shall submit to the joint standing committee of the Legislature having jurisdiction over marine resources matters a science-based comprehensive resource management plan for Taunton Bay. The plan must address the principal user groups, including recreational, scientific and commercial mussel harvesting interests, in the context of sustaining the ecological processes, functions and values of Taunton Bay. The plan may include proposed legislation to implement the department's recommendations for resource management in Taunton Bay.

Throughout development of this plan, every attempt was made ensure that each measure be consistent with the guiding principles of the *Taunton Bay Study*, the LWRC's Bay Management Study, the Maine Coastal Policies Act of 1978 and ecosystem based management. We found that none were mutually exclusive.

## **Proposed Comprehensive Management Plan Management Goal**

Three municipal, seven state, and six federal agencies have separate and sometimes overlapping jurisdictions, each with its own set of management priorities. The potential for conflicting goals is real and constrains any proposal at its outset. Nevertheless, a clear set of goals and objectives to guide management direction and provide benchmarks against which performance may be

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<sup>1</sup> This committee consists of the Commissioners of all the natural resource agencies.

assessed is still possible, although challenging, while respecting the priorities of the other jurisdictions.

To a large extent, the goal for this Taunton Bay plan was predefined by the enabling Legislation of 2000; “The plan must address the needs of principal user groups, including recreational, scientific and commercial mussel harvesting interests, in the context of sustaining the ecological processes, functions and values of Taunton Bay.” As a public trust resource, Taunton Bay’s water, subtidal lands, and fisheries and wildlife are held for all the people of Maine, a goal consistent with that of the *Taunton Bay Study* that concluded that the “primary coastal management goal is to sustain those resources for the long-term benefit of all citizens.”

The premise of the original legislation was that uncontrolled dragging was incompatible with the overall goal of sustaining ecological processes, functions and values of the resources within Taunton Bay. It is important to note, however, that the Legislature acknowledged that “intensely managed dragging” might be possible if “conducted in accordance with a comprehensive plan,” hence this proposal.

**Proposed Goal** – The goal of the Taunton Bay Comprehensive Resource Management Plan is to manage human uses of Taunton Bay in a manner that

- 1.) protects and sustains ecological functions and values, and
- 2.) manages marine resources for the long-term use and enjoyment of all citizens of Maine.

## **Geographic Boundaries**

Taunton Bay is an open system. Atmospheric contaminants are deposited to Taunton Bay from around the globe, water flows in and out with the tides through Frenchmans Bay which is in turn derived from North Atlantic Slope Water via the Eastern Maine Coastal Current. Finfish, mammals and birds enter and exit seasonally affecting biological communities and nutrient budgets. Even apparently sedentary species of invertebrates, shellfish and plants are immigrants, having drifted into the bay as plankton from areas far from Taunton Bay. In other words, Taunton Bay resources are not necessarily derived within nor confined to Taunton Bay.

Inclusion of a land watershed in the boundary therefore makes sense as does inclusion of Frenchmans Bay. As the management area increases in size, however, the likelihood of losing focus on the bay increases. We suggest that the issues of concern within Taunton Bay are sufficient to warrant primary focus on the bay. Furthermore, a sufficient number of activities within Taunton Bay play significant and direct roles over its own internal ecological health. The original dragging moratorium was one such activity and remains a primary concern for many. Furthermore, given the lack of available resources and the comprehensive nature of the management plan, we recommend focus be on the bay with the following qualifier.

Delineating the bay as the primary management unit does not mean work in the watershed or beyond the bay must be ignored or may not be addressed. However before external factors are addressed there should first be a conscious evaluation and finding that work beyond the immediate bounds of the bay contributes toward and is likely to achieve the management plan’s goals and objectives.

### Proposed Boundary

The boundary for the TBCMP is to include the public trust resources comprised by water, fisheries, and subtidal bottom, fish, plants and wildlife that are inland of Hancock Falls (Figure 1).

Figure 1

Proposed Boundary of Taunton Bay for Purposes of the Comprehensive Management Plan.



### Governance

From the many meetings and discussions with individuals who live around and work on Taunton Bay, there appears to be unanimous support for more direct local involvement in Taunton Bay's management. Not surprisingly, some wanted no State involvement whatsoever. However, by statute, the State is ultimately responsible for marine resource management of Taunton Bay. And the principles set forth in both the *Taunton Bay Study* and the LWRC principles acknowledge the role of state government. However, the reality is that the State lacks the capacity to dedicate resources to Taunton Bay to the satisfaction of local citizens.

Upholding State responsibility while fostering more and direct local involvement in public resource management are not mutually exclusive. The State has long supported local

involvement and public participation in managing marine resources. Many municipalities, for example, have been given the authority to manage their intertidal mudflats for softshelled clams. And various councils advise the Department and State on management issues. Some are established in statute, (e.g. the lobster zone councils, urchin zone councils, scallop council, and DMR Advisory Council) while others are informal (e.g. seaweed council). Regardless of origin, all actively participate in resource management and decision making. Each contributes local knowledge and perspective on management measures, research needs, and informs state managers of emerging concerns. The recently completed Draft Bay Management Study report to the Legislature endorses direct involvement at the local and regional scale as a sensible path forward to regional management.

### **Proposed Governance**

We propose an Interim Taunton Bay Natural Resource Advisory Group to represent a range of perspectives and interests. Composed of eight members (Table 1) appointed by the Commissioner of DMR, this group will have an initial term of one year, during which the details of self-governance will be developed and the Comprehensive Resource Management Plan<sup>2</sup> for the bay refined. The Group will have primary responsibility for managing the CRMP. We suggest the group work through consensus, advise the Commissioner on progress and recommend measures to improve the plan.

Table 1

#### **Interim Taunton Bay Natural Resource Advisory Group<sup>3</sup>**

1. Municipal Representative
2. Wild Harvester\* - Commercial mussel harvester
3. Aquaculturist
4. Conservationist
5. Business owner
6. Science\*
7. Recreation\*
8. DMR representative

### **Measurable Management Objectives**

Clearly defined specific objectives that can be measured are key to knowing whether a management plan is meeting its goal. Science and local knowledge can provide valuable assistance setting these. From the *Taunton Bay Study*, a list of 25 indicators of Taunton Bay's ecological health emerged to form an excellent basis to set objectives. The necessary follow-up step to naming the objectives is to establish attainable thresholds or targets. For some, we are ready to propose actual numbers. For others, where information is lacking, we can only describe general qualities.

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<sup>2</sup> The workplan will refine the goal of the management plan, identify priorities for funding, set near and long term measurable objectives, develop a timeline for benchmarks, etc.

<sup>3</sup> \*denotes principle user identified in legislation

Objectives must be measurable. They also must be within the capability, budget and technology of those responsible for measuring them. If objectives are not being attained, then a review is triggered to determine if management needs revision or whether the objective itself should be reconsidered. In this sense, objectives become testable hypotheses. The possibility of changing objectives must not be ignored, especially in biological systems where we frequently lack a good understanding. All parts of the Taunton Bay system are in dynamic relationship with one another, each responding to changes in other parts of the system. The achievement of one objective may result in the non-attainment of another. This is especially true with interspecific competition where rises in one population correspond to declines of another (e.g. predator – prey, habitat displacement) and vice versa. All objectives must be regularly reassessed to ensure they remain appropriate in the context of ecological science. The following section begins the process of establishing clear objectives. In some cases objectives will be quantitative and in other cases qualitative.

### **Governance**

How the Taunton Bay plan is implemented is perhaps as important as what this plan achieves. Like the goal, objectives and their thresholds are largely value judgments that reflect the thinking and beliefs of those setting them. Since one of the goals for Taunton Bay is that it be managed for the long term use and enjoyment of all the citizens of Maine, it is very important that the Taunton Bay Natural Resource Management Committee develop measurable objectives with broad representation of harvesters, community members, managers and scientists.

#### *Objectives –*

- *Taunton Bay Natural Resource Advisory Group will represent a breadth of interests and uses.*
- *Taunton Bay Natural Resource Advisory Group will meet at least twice per year and report the DMR Commissioner on issues, findings and progress on the plan and make recommendations for improvements.*

### **Protected Marine Wildlife Resources**

A number of wildlife species directly dependent on Taunton Bay are of particular interest. Bald eagles, osprey, harbor seals and at least six species of migratory shorebirds inhabit the bay for part or all of the year. Although State or federal law, and in some cases both, prohibit the direct taking of these species, indirect effects of changing habitat and food resource availability have been raised as concerns. With the exception of some shorebirds, the wildlife noted above do not appear to require additional protection measures.

Regarding shorebirds, disturbance from landside development is now being addressed through changes in the Natural Resource Protection Act. Restrictions on development adjacent to Significant Wildlife Habitat designated by the Maine Department of Inland Fisheries and Wildlife are aimed at protecting habitat use, specifically shorebird foraging mudflats.

A second concern around shorebirds is that commercial digging of worms and clams either disturbs the birds so they do not feed or digging reduces available food resources. Food studies document the importance of mudflat organisms to shorebirds, especially amphipods, polychaetes and biofilms (e.g. epibenthic diatoms). Whether the abundance of food organisms is being

meaningfully reduced or whether disturbance by humans and domestic pets are disrupting shorebird feeding in Taunton Bay is not known.

Migratory shorebirds are affected by many factors other than those found in Taunton Bay. Most of these birds use Taunton Bay as a staging and feeding area for brief periods of time, especially late summer, enroute to South America. Since both harvest and human activity occur in Taunton Bay, we consulted scientists working on shorebirds in the Bay of Fundy and Maine regarding the potential for adversely affecting shorebirds. In the case of Bay of Fundy, several graduate theses, about to be published, conclude that shorebirds are more opportunistic than previously believed. Commercial digging did not appear to result in a reduction of food organisms to the point of concern. Some field investigators believed digging enhances food availability. The birds seemed to either move their feeding to adjacent areas where digging was absent or habituate to the presence of diggers.

Given the dynamic and transient nature of these wildlife populations, setting quantitative objectives that are relevant to the health of Taunton Bay may be inappropriate. We therefore conclude that it is premature to close areas of the bay to benefit shorebird feeding. Instead, we recommend assessing factors we know benefit shorebirds within Taunton Bay, especially as they relate to food availability. This can be accomplished in conjunction with the benthic infauna monitoring proposed below in which the sampling design allocates effort in Hog Bay, a significant wildlife habitat for shorebirds.

#### *Objectives – Protected Marine Wildlife Resources*

- *Conditions in the bay are sufficient to support healthy populations of eagles, osprey, and harbor seals.*
- *Overall mudflat food organisms are in sufficient supply to support migratory shorebirds*

#### **Habitat**

The *Taunton Bay Study* identified six principle habitats: mud, gravel, salt marsh, eelgrass, kelp and rockweed. The water column is also a habitat but is covered separately below under water quality. And some habitats actually house other habitats, (e.g. mud and eelgrass), so the distinction is not always clear. Recent aerial surveys of Taunton Bay suggest that, excepting eelgrass, acreage of habitat type is more or less stable. Yet within habitat types, physical disturbance from hand harvest of clams and worms, and pipelines are apparent. The significance of that disturbance is not completely understood, however we do know that activities such as hand harvest and dragging have been part of Taunton Bay for centuries. We also know that virtually every study on physical disturbance concludes that impact is driven by frequency, intensity, timing and habitat type. Recovery varies from days in dynamic habitats that are subject to natural disturbance (e.g. shifting sands) to decades in habitats that are structurally complex (e.g. eelgrass and corals). The severe decline in eelgrass in 2002, shortly into the moratorium, raised widespread concern. Was this abrupt event a result of a natural or human activity? How has eelgrass absence contributed to suspension of bottom sediments? What has been the effect on the bay's resident fishes?

Maine's Natural Resources Protection Act regulates disturbance of soils and vegetation in, on, and adjacent to coastal wetlands such as Taunton Bay. Two activities, aquaculture and



commercial fishing, occur in Taunton Bay that are exempted from NRPA review (together with 24 other exemptions). Aquaculture leases undergo extensive separate and multiple public reviews to avoid harm, including an assessment of effects on marine habitat. Commercial fishing, on the other hand, has traditionally received less review.

Historically, impacts from fishing were limited in size, scope and intensity, and time existed between harvests for most systems to recover. Today, however, overall habitat degradation from non-harvest activities (e.g. development, recreational boating and fishing) combine with fishery harvest impacts to cumulatively result in habitat impacts that are greater than ever before. Consequently, it is important to reduce and minimize impacts from all activities, including those from fishing.

Some forms of harvest, like worming and clamming, are essentially the same today as they were 100 years ago. Harvest methods like bottom dragging, however, have benefited from greater horsepower, navigational technology and stronger materials. Not only has access been opened to places not previously fished, but also size and weight of equipment has increased the intensity of fishing impacts.<sup>4</sup> In Taunton Bay, harvest of mussels, clams and worms, all abundant in specific areas of the bay, is probably the major source of human habitat disturbance. Two objectives are proposed to minimize habitat disturbance.

#### *Objectives – Habitat*

- *disturbance to bottom habitats is limited to that necessary for harvest, and*
- *no more than 10% of eelgrass beds are disturbed by harvest activities*

#### **Water Quality**

Water quality is an obviously important driver of ecosystem health. Several natural features predispose Taunton Bay to water quality stress. Although more than half of Taunton Bay's water volume drains twice a day on the tides, its inland distance from the Gulf of Maine results in water returning on incoming tides leading to retention of pollutants. Four water quality concerns emerged from our public meetings; siltation (e.g. turbidity), eutrophication (nutrient overenrichment), sewage, and toxic contamination.

Siltation is a concern for at least two reasons. Suspended in the water column, silts and clays reduce photosynthesis. When these particles settle, in excess, they clog gills of sedentary animals such as shellfish as well as cover seaweed and eelgrass leaves, again, reducing photosynthesis. Taunton Bay is a mudflat dominated ecosystem. Waves, heavy rain, and ice regularly result in naturally high levels of water column sediment turbidity. The *Taunton Bay Study* identified bluff erosion as another source of turbidity. The Taunton Bay system has evolved with high levels of suspended sediment and lengthy flushing. We do not know the natural variability of sediment in the water column to put human sources into any meaningful context. However, the Taunton Bay Study as well as the motive for the original moratorium identified siltation from dragging as a concern to be addressed.

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<sup>4</sup> Note that some activities, like diver harvests, may have little if any effect on habitats yet can very thoroughly deplete a population.



Nutrient enrichment results in excess growth of plants that in turn can shift eelgrass and rockweed plant communities to one dominated by phytoplankton through a mechanism similar to siltation. Phytoplankton blooms reduce light penetration through the water column to where inadequate light reaches bottom dwelling eelgrass. Eelgrass leaves can also be covered with diatoms which in turn reduce light penetration through the leaf surface. If nutrient supply and conditions are right, phytoplankton can grow to nuisance numbers leading to dissolved oxygen depletions and/or toxic algal blooms. Based on water clarity and some limited water sampling, conditions in Taunton Bay do not reflect eutrophic conditions.

Toxic contaminants come from a variety of sources, near and far. Contaminants include pesticides, heavy metals, petroleum by products, pharmaceuticals, personal health care products, and specific industrial compounds. While some environmental contaminants such as lead, PCBs, and several pesticides have declined significantly in recent years, others such as flame retardants, appear to be on the increase. No information is known about the levels of contaminants in Taunton Bay.

In addition to nutrients and toxic contaminants, sewage threatens water quality by adding human pathogens. This can present a direct risk to humans through water contact (swimming) and consumption of contaminated shellfish. Three areas of Taunton Bay are presently closed to the taking of shellfish due to potential sewage contamination.

#### *Objectives – Water Quality*

- *Maintain the light penetration depth through the water column to protect historically mapped eelgrass beds*
- *Maintain stable or declining levels of toxic contaminants*
- *Prevent an increase in shellfish closures*
- *Attain State of Maine swimming standards*

#### **Harvested Marine Resources**

Beyond the obvious benefit as an economic resource, living harvestable resources play important ecological roles in Taunton Bay. They recycle nutrients, filter the water column, process and stabilize sediments, are food for wildlife, and in some cases are themselves habitat for other organisms. Arguably their condition may most comprehensively reflect whether the overall goal for Taunton Bay is being attained. Unfortunately, the condition of each stock is based largely on anecdotal reports. Setting measurable objectives for this group requires additional information.

Horseshoe crabs in Maine are in low numbers relative to more southern parts of the eastern seaboard. In 2003, Maine's horseshoe crab fishery was closed in Taunton Bay to protect their reproduction in what is the most northern documented breeding area. In Taunton Bay and elsewhere in Maine, based on numbers from our volunteer census, populations appears to be responding increasing.

Mussels are an economically important resource to local harvesters. A study of the mussel beds was attempted in 2005 to estimate the amount of harvest the bed could sustain. The study was not completed. Prior to the moratorium, the mussel fishery received light but reportedly sustainable harvests. Since the moratorium, Taunton Bay's mussels have grown too old, pearled,

or weathered to be commercially harvestable. Removal and thinning may be the best way to reestablish this fishery however it is unclear how this should be done to avoid impacting other habitats(?). Nonetheless, the mussel resource is locally valuable and if properly managed can once again become a viable fishery of the bay.

Worms and clams support more harvesters in Taunton Bay than any other species. The *Taunton Bay Study* estimated that combined, these two fisheries are Taunton Bay's most valuable. Hog Bay appears to support most of the fisheries. Of the three towns bordering Taunton Bay, only Sullivan has a municipal shellfish program. Inadequate information is known about stock status, although the fact that the bay supports the number of harvesters that it does, suggests that stocks are still commercially viable.

Scallop and urchin stocks in Taunton Bay once supported a drag harvest. More recently, these fisheries have become diver only harvests. Local knowledge suggests that both resources have largely been commercially depleted here as in most other areas along the coast.

#### Lobsters, Crabs, Finfish, (except eels) and Seaweeds (kelps and rockweed)

Anecdotal reports suggest that these fisheries are now being harvested at sustainable levels. However, lack of data on stock condition within and removal rates from Taunton Bay make assessment difficult. Absent public concern, no changes in management are proposed for these resources.

The American eel is managed through the Atlantic States Marine Fisheries Commission. Throughout its range, the American eel population has experienced significant declines. The fishery has been reduced in Maine through a limited entry license lottery and continued reduction in effort is anticipated each year.

Aquaculture in Taunton Bay occurs in both the bay and on its shores. Activity in the bay is restricted to one oyster lease, within which, American oysters are grown in floating trays and on the bottom. To address a concern that aquacultured oysters might reproduce and outcompete local species, a condition requiring annual monitoring of likely oyster habitat was incorporated into the lease agreement. Two years into the lease, no oysters have been found off the lease site. On land, the University of Maine and US Department of Agriculture operate an aquaculture research facility. Species reared include Atlantic salmon, halibut, cod, and marine worms. The facility has a permit to discharge effluent. That permit controls the amount of nutrients, solids, and organic matter discharged to the bay. Since the facility reuses about 90% of its water, the discharge volume is small relative to amount of water used. Monthly monitoring of the effluent quality is required.

#### *Objectives*

- *Horseshoe crabs- population trends to remain stable or increase*
- *Mussels, scallops and urchins - restore populations to a balanced structure that supports an annual commercial harvest.*
- *Worms, clams, lobsters, crabs, finfish, and seaweed – support sustainable commercial and recreational harvests*

- *Aquaculture - measurable impacts from aquaculture operations are confined to the lease site or vicinity of discharge.*

## **Proposed Methods to Achieve Objectives**

How to achieve the above objectives presents a challenge. One objective may require several methods while one method may serve several objectives. The following proposals are suggested as a beginning point for public discussion.

### Benthic Infauna Survey

To address shorebird feeding issue as well as water quality concerns, a periodic mudflat infauna survey is suggested.

1. Once every 5 years, conduct a quantitative survey of intertidal infauna.

### Aerial Photography

Habitat change can be effectively monitored through periodic aerial photography. The State currently collects high resolution color orthophotography of the entire coast, about once every 10 years. This interval is inadequate for capturing sudden changes like the eelgrass loss of 2002.

1. Supplement high resolution color orthophotography with less expensive but more frequent low level photography.

### Volunteer Monitoring

Much, if not most, of the resource information in Taunton Bay has been collected through the generous donation of time by citizen volunteers. The Friends of Taunton Bay is a prime example of citizen volunteers who have served the bay, those interested in the bay, and State resource managers well. Their role and that of others citizens can assist by participating in the following:

1. Continue horseshoe crab spawning population survey
2. Begin measuring Secchi disk water transparency twice monthly.
3. Collect monthly summer water column samples for chlorophyll-a analyses.
4. Collect mussels at one index site for measurement of Gulfwatch toxic contaminants

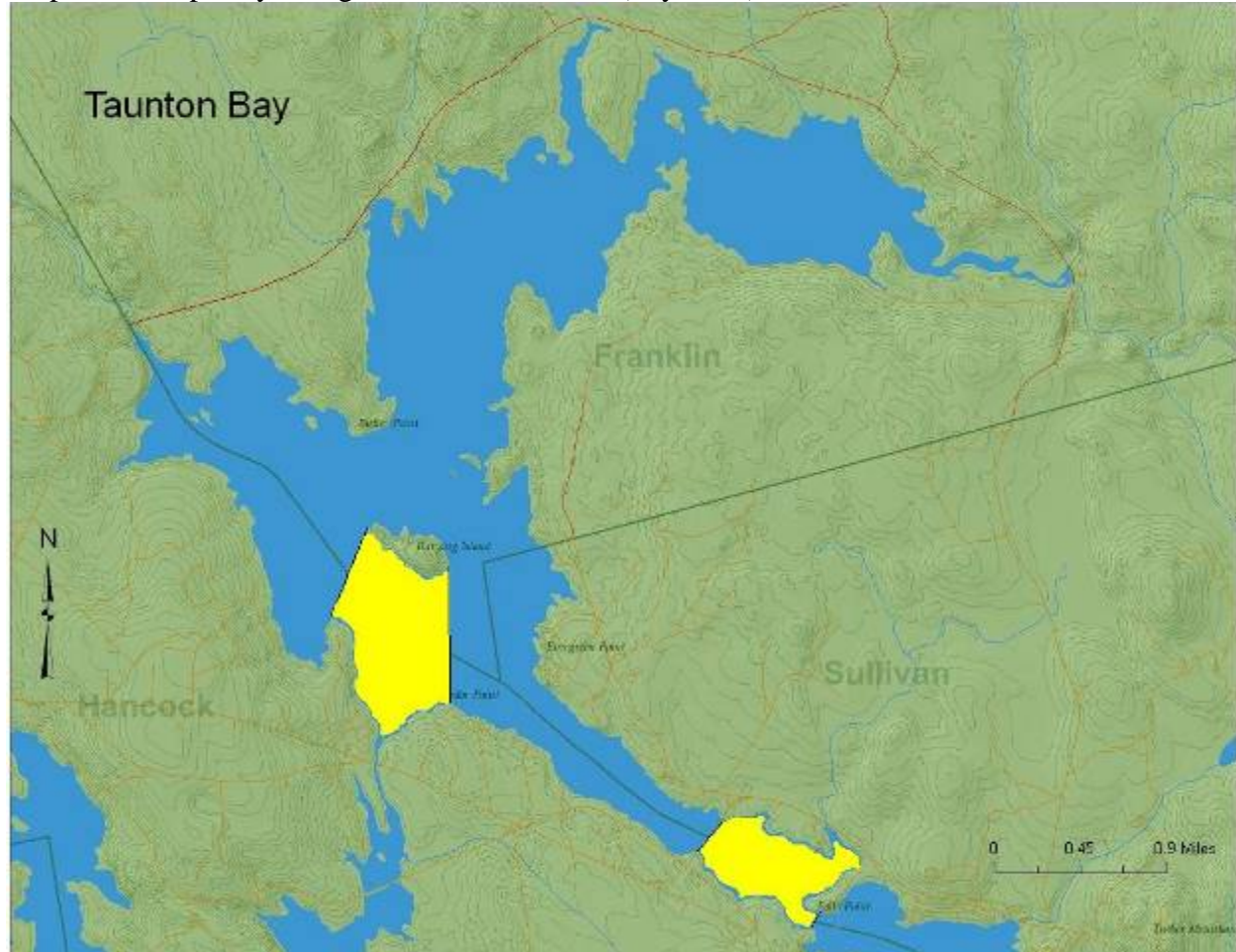
### Establishment of Designated Mussel Fishing Zones

Most of the mussel resource in Taunton Bay is located in a few limited areas.

Although manual methods for harvesting mussels were tried during the dragging moratorium, they were found to be neither cost effective nor safe. From the dragging study conducted by the DMR in 2003-2004, we concluded that limiting dragging could be done without causing irreparable damage. We also concluded that if dragging avoided overlap with non-target species and sensitive habitats such as eelgrass, that a drag harvest can be consistent with the long term sustainability of the bay. Two areas (Figure 2) are initially proposed as designated dragging areas for mussels, both designed to protect eelgrass habitat and one with a seasonal restriction to protect breeding horseshoe crabs.

- 1.) Between Rte 1 bridge and Hancock Falls with no seasonal closure, and
- 2.) Egypt Bay area within line from Cedar Pt and southernmost tip of Burying Island to northern most tip Burying Island to "unnamed" Point, with a seasonal closure between May 1 and July 31 to protect breeding horseshoe crabs.

Figure 2  
Proposed Temporary Designated Harvest Areas (in yellow)



#### Hand Harvest Restrictions

To minimize disturbance of habitat from hand digging to that necessary to harvest the resource and better understand the status of stocks, we propose the establishment of density criteria that govern when a flat is to be closed or open.

1. Where no municipal shellfish program exists (Hancock and Franklin), flats will be open to clamming only when populations exceed 12 legal size clams per square meter. Harvesters will be responsible for measuring clam density. Sullivan is encouraged to consider a similar approach.
2. Worming will only be open when worm density equals or exceeds 3 worms per square meter (see how this is to be done under Stewardship below).

#### Temporary Diver Closure

Whether or not scallop and urchin populations would recover through a short term closure is unknown. However, a temporary closure could serve as a pilot project to track recovery on a small scale as well as testing the efficacy of stock enhancement techniques.

1. A four year closure on diver harvest to test recovery of scallop and urchin stocks

### Harvest Reporting

As in virtually every other area of Maine's coast, the condition of resources within Taunton Bay is more inferred than known. For resource management to be targeted, efficient and to avoid unnecessary or ineffective regulation, information on the status of local stocks is key.

1. As a condition of being able to harvest in Taunton Bay, all harvesters must record the date, hours fished, gear, species harvested, and pounds harvested. These records must be submitted on a monthly basis to the DMR where they will be considered confidential fishery statistics.

### **Funding**

No funds are identified to specifically support this plan. Furthermore, because the DMR and State are responsible for managing marine resources for the entire coast, it is important to acknowledge that support by the State is limited. Nevertheless, forward progress can occur by integrating this plan with ongoing efforts of others. For example, DMR already samples water quality for shellfish safety. There may be an opportunity to collect additional samples to assess State swimming standards. Harvesters can conduct assessments as a condition of their privilege to harvest in Taunton Bay and a proposed DMR long-term index station network might consider including Taunton Bay.

### **Stewardship, Roles and Responsibilities**

The principle of stewardship is a theme that runs throughout the LWRC's Bay Management Study, the Taunton Bay Study and ecosystem based management. Stewardship presumes that each individual user has a responsibility to manage the resource in a sustainable way. By definition, a steward must actively participate in management. Roles for stewardship exist at every level, from individual, harvester, organization, through the various sectors of government. Even with full funding, success of this plan still depends on full participation of stewards. Not only is it impossible for any one individual or organization to carry the burden of stewardship, it is contrary to the principle and spirit of local participation. Each user has a responsibility to contribute something back to Taunton Bay, if even small in gesture. Below are some proposed roles and responsibilities for stewards named throughout this plan that could move the plan forward without large infusions of funding.

### **Taunton Bay Comprehensive Resource Management Committee**

The role of this group is to act as a central coordinator to build consensus views on the issues related to condition, vision and management of Taunton Bay.

- 1.) establish a set procedures by which they will operate (we recommend through consensus as opposed to majority)
- 2.) clarify and establish clear goals and objectives
- 3.) organize and convene meetings that represent a broad range of interests,
- 4.) develop a revised workplan in consultation with others
- 5.) develop MOA between the State and municipal governments.
- 6.) advise the State on findings and make recommendations for improved management
- 7.) oversee harvester inventories (see Harvesters below)

### **State of Maine**

The State of Maine will work with the Taunton Bay Natural Resource Advisory Group, harvesters, municipalities and the public to encourage and reward local involvement by providing technical support and advise to the extent resources allow.

- 1.) Commissioner of DMR will identify a staff member to staff the Interim Taunton Bay Natural Resource Advisory Group.
- 2.) provide GIS, science, and policy support to the extent resources allow
- 3.) develop protocols for harvester stock assessments to the extent resources allow
- 4.) receive counsel and recommendations from the Taunton Bay Natural Resource Advisory Group

### **Harvesters**

As direct beneficiaries of goods from Taunton Bay, harvesters have a vested interest in the long term health and sustainability of the bay. Harvesters also assume a significant responsibility to ensure the success of the management plan by participating in implementation of the monitoring component of the plan. A number of municipal shellfish programs require a certain number of hours community service that are put toward the resource as a condition of their license. We propose that this be applied to all harvest activities in Taunton Bay, drawing from the following list:

- 1.) share local knowledge with others
- 2.) engage in dialogue will the Taunton Bay Natural Resource Advisory Group
- 3.) recommend alternatives to proposals
- 4.) assist with conducting resource inventories and stock assessments
- 5.) share landing information of resources harvested from Taunton Bay

### **Property Owners, Recreational Users and NGOs**

This group also benefits directly, whether through increased property values, access to recreational opportunities, or membership. At the same time, this sector impacts the bay to some level by their mere presence. Whether through sewage, non-point source pollution, or restricting access, property owners, recreational users and non-profit organizations affect the long term use and enjoyment of Taunton Bay by others. This group can contribute to the management plan through specific ways:

1. assist in identifying and raising funds to implement the plan
2. engage in dialogue will the Taunton Bay Natural Resource Advisory Group
3. work to improve harvesters access to Taunton Bay

### **Municipalities**

The three towns surrounding Taunton Bay have a role in helping to ensure that ordinances and their compliance is consistent with the overall goals of the management plan.

1. receive counsel and recommendations from the Taunton Bay Natural Resource Advisory Group
2. work to adopt recommendations of Taunton Bay Natural Resource Advisory Group that are consistent with town goals that will lead to the success of the management plan.
3. work with the Taunton Bay Natural Resource Advisory Group on the municipal role in shellfish management

### **Plan Implementation**

There are a number of features that we believe will promote the likelihood for this project to succeed. Legal mechanisms, including existing regulations and the Administrative Procedures Act, are adequate to move much of this plan forward. Some elements, however, such as the urchin closure for Taunton Bay, may not be possible in the context of statewide rules. Three features that we hope are included in the final plan are listed below.

Ability to manage adaptively – A key aspect of this management plan is its ability to respond and adapt to new information in a timely fashion. Title 12, Section 6171 allows the Commissioner to regulate the fishery of one marine organism to protect another marine organism. However, paragraph 5 of that statute designates these as major substantive rules, requiring approval by the Legislature before adoption. Depending on when, in the Legislature's cycle, the need arises, the rule could take 2 years before its adoption. It is likely that most of the objectives, and especially the methods to achieve them, will need revision as we learn more and the bay itself changes. If we conclude, for example, that the designated dragging areas are not working; either unnecessarily restrictive or too restrictive, how can we ensure prompt correction? We are considering at least two mechanisms by which we might achieve adaptive management.

1. Could 6171 – Paragraph 5 - be changed from major substantive to technical rules?
2. Can Taunton Bay be designated a Special Management Area within which, major substantive do not apply?

Special Management of Science Areas - Many of the objectives and methods to achieve them are based on professional judgment and inference. It is very important, for both the people who use the bay as well as the resources themselves, to understand whether or not these proposals are effective and/or worthy of continuing. It is not in anyone's interest to continue a failed plan. Setting aside certain areas of the bay as special science areas, that are protected from disturbance, can help evaluate many of these proposals.

1. Authorize the DMR Commissioner to designate, through technical rulemaking or special permit, public trust areas for bonafide research that are protected from disturbance. These areas will be protected only as required by the specific research and for the minimum time and area necessary to conduct the science. The research must pass review by a panel (e.g. DMR Advisory Council). Science area designation only goes into effect once a plan is adopted. All data and results will be available to the public.

Special Permit to Harvest within Taunton Bay – It is ironic that if this resource management plan is successful, there exists the real potential for attracting harvesters from outside the region in excessive numbers. The unintended consequence of the plan's undoing suggests that there may be a successful plan suggests we may need to anticipate controlling effort to maintain at sustainable levels. Several methods have traditionally been used to accomplish this, including a Total Allowable Catch (TAC) for Taunton Bay, limited entry, and restrictions on gear type, size, etc. None are popular. Traditionally, Maine's fishing community has enjoyed the flexibility to shift from one species to another, from one area to the next, and to have open access for all to fish. These characteristics of Maine's coastal fisheries have been important to the keeping of fishing communities alive. They may also need to be reconsidered.



If proposals for mandatory reporting of landings and effort coupled with the requirement for harvesters to participate in resource management activities are accepted, we expect to be able to control effort and thereby avoid loss of some of Maine's traditions. To track harvesters and ensure that they participate in resource management activities, a special permit may be required to harvest in Taunton Bay.

1. Investigate the need for a special license to harvest in Taunton Bay.

## **Summary**

The above proposal represents a synthesis of information gathered from the public over many years as well as that compiled by the Taunton Bay Study. The plan attempts to embrace principles that incorporate local knowledge, participation, and responsibility to foster sustainable stewardship of Taunton Bay's natural resources for all Maine citizens. Measurable goals and objectives are proposed to guide public discussion and the ultimate refinement of a Taunton Bay Comprehensive Resource Management Plan and some initial steps to begin implementation are offered.